# Alcohol & Drug Dependence, Pathological Gambling and Other Impulsive Behavioral Disorders

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## Addictive and Other Impulsive Behavioral Disorders

- Alcohol and Drug Dependence
- Pathological gambling
- Kleptomania
- Compulsive sexual behavior and paraphilias
- Compulsive buying
- Pyromania
- Trichotillomania
- Compulsive Internet use

## Common Core Qualities of Impulsive Behavioral Disorders & Addictions

- Repetitive or compulsive engagement in a behavior despite adverse consequences
- Diminished control over the problematic behavior
- An appetitive urge or craving state prior to engagement in the problematic behavior
- A hedonic quality during the performance of the problematic behavior, which has salience over other rewards

## Common Core Qualities of Impulsive Behavioral Disorders & Addictions

- Tolerance
- Withdrawal syndrome
- Repeated desire to reduce or stop, or unsuccessful attempts to cut back or stop
- Physical, Mental, and Social problems due to behavioral disorder do not attenuate it.

## Co-Occurrence of Impulse Disorders and SUDs

- Rate of substance abuse 7-fold greater than among non-gamblers.
- Common genetic vulnerability between gambling and alcohol dependence
- 23% to 50% of kleptomania patients with SUD
- 30% to 46% of compulsive buyers with SUD
- 33% of substance abusers may have gambling problem

## Common Characteristics

- High rates of co-occurrence of impulse Control Disorders and Substance Use Disorders starting in young adulthood.
- The telescoping phenomenon
- Common brain activity changes underlying gambling urges and alcohol & cocaine cravings

## Nicotine Dependence

- Elevated rates of co-occurrence: 41-69% (compared to 25%)
- Associated with more severe substance use problems in gamblers
- Associated with more severe gambling problems
- Association holds even after stopped smoking

## Dynamics of Multiple Addictions & Impulse Control Disorders*

- **Switching**: Replacing one addiction with another
- **Alternating**: Cycling from one addiction to another in a patterned, systematic way
- **Masking**: Using denial around one addiction to cover up for another
- **Ritualizing**: one addiction is part of the ritualizing for another

*Patrick J. Carnes, Ph.D.

## Dynamics of Multiple Addictions (con't.)

- **Intensifying**: Using addictive patterns simultaneously to intensify the overall experience
- **Numbing**: using addiction to medicate shame and pain due to another addiction
- **Disinhibiting**: Using one addiction to lower inhibitions for other addictive acting out

## Family History: Impulse Control Disorders

- Compulsive buying patients : 25% of first-degree relatives have SUDs
- 20% of kleptomania subjects' first-degree relatives with SUD
- 52% of gamblers with first-degree relative with alcohol use disorder

## Pathological Gambling Criteria

Persistent and recurrent maladaptive gambling behavior as indicated by five (or more) of the following:

- is preoccupied with gambling
- needs to gamble with increasing amounts of money in order to achieve the desired excitement
- has repeated unsuccessful efforts to control, cut back, or stop gambling

## Pathological Gambling Criteria (cont'd)

- is restless or irritable when attempting to cut down or stop
- gambles to escape from problems
- "chases" losses
- lies to family members, therapist, or others
- has committed illegal acts
- has jeopardized or lost a significant relationship, job, or educational or career opportunity
- relies on others for money

## Economics of Gambling

- United States leisure economy (1996) - gross gambling revenues = $47.6 billion
  - Greater than revenues of film + recorded music + cruise ships + sports + live entertainment
- In 2001, Americans made 303 million trips to casinos contributing to gross gambling revenue of $63.3 billion.

## Internet Gambling

- In 1998 there were over 600 online gambling sites.
- By 2000 this number had grown to over 800.
- National Gambling Impact Study Commission (1999) – 14.5 million Internet gamblers and $651 million in revenue.
- Current (2002) electronic gambling revenue - nearly $3 billion.
- Projected for 2006 - $8 billion.

## Problem Gambling: Epidemiology

- Estimates of adult pathol gambling problems- 1.46% (pathological gambling) and 2.54% (problem gambling).
- Total of 4% of adults in Unites States have a gambling problem (approximately 9 million people).
- Similar rates in other countries: Sweden (2.0%), Switzerland (3.0%), as well as Britain, Australia, South Africa, Japan, Korea.

| National Comorbidity Study | Past Year Rates (%) for All Ages |
|---|---|
| Anorexia Nervosa | 0.1 |
| Schizophrenia / schizophreniform | 1.1 |
| Panic Disorder | 1.3 |
| Anti-social Personality | 1.5 |
| Social Phobia | 1.7 |
| Obsessive Compulsive | 2.1 |
| Dysthymia | 2.5 |
| Drug Use Disorder | 2.9 |
| Cognitive Impairment | 2.9 |
| Pathological Gambling | 4.0 |
| Major Depression | 5.8 |
| Alcohol Use Disorder | 7.3 |
| Any Phobia | 11.0 |
| Any Anxiety | 12.7 |
| Any NCS disorder | 28.0 |

## Characteristics

- Age: usually begins in early adulthood
- Gender: 32% female, 68% male
- Males tend to start at an earlier age
- Telescoping phenomenon
- Mean time: 16 hours per week
- Amount Lost: 45% of gross annual income
- Triggers:
  - Advertisements, Boredom, Stress

## Social/Personal Consequences

- **Family dysfunction and domestic violence** (spousal and child abuse)
- **Alcohol and other drug problems**
- **Psychiatric conditions** including major depression and anxiety disorders
- **Suicidal thoughts and attempts**
- **Significant financial problems** (bankruptcy, unemployment, poverty)
- **Criminal behavior** (theft, prostitution, homicide, fraud, embezzlement)

## Adolescent Gambling

- 3.2% to 8.4% of youth may have a serious gambling problem.
- Alberta survey (1995) - 8% were "problem gamblers" and 15% were "at risk" for developing a gambling problem
- Oregon (1998) - 4.1% were classified as having a gambling problem.
- Manitoba (1999) - 78% had gambled in the past year and 3% had a gambling problem.

## Developmental Biology

- Environmental and genetic influences - vulnerability to and expression of addictive disorders
- Changes in brain structure and function during adolescence might influence the motivation to engage in risk-taking behaviors like gambling.

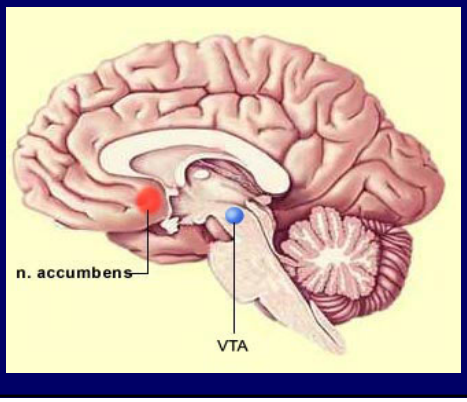
## Reward Deficiency Hypothesis

- Dopaminergic (DA) neuronal networks
  - evaluate received (vs expected) rewards
  - facilitate learning of complex, slow cued motor action sequences to get the reward, esp if marked DA increase
  - Later cue —> rapid sequence activation
- Low baseline DA in some
  - May be genetic and/or environmental
  - Potent $ or drug rewards activate >> more common rewards
  - Reinforces drug/$ seeking
- Deficient inhibition
  - Inhibition of learned motor responses to cues is slow and requires activity in suppressing networks
  - Excessive and eficient response inhibition (involving glutamate/GABA balance)

## Role of Dopamine

- Dopamine release into the nucleus accumbens - translates motivated drive into action - a "go" signal
- Dopamine release increased if reward > expected and → reinforcement of behavior
- Dopamine release - maximal when reward is most uncertain, suggesting it plays a central role in guiding behavior during risk-taking situations.

- Structure and function of dopamine neuronal projections to the nucleus accumbens - change following rewarding experiences
- In reward-related learning, future behavior is determined in part according to past reward-related experiences
- Neuronal structure/connection strength changes involve the nucleus accumbens.



## Role of Serotonin

- Decreased serotonin associated with adult risk-taking behaviors - alcoholism and pathological gambling.
- Blunted serotonergic responses in the ventromedial prefrontal cortex - in individuals with impulsive aggression
- Implicated in disadvantageous decision-making - adults with gambling or SUDs


## Pharmacological Treatment

Placebo Controlled Trials – SSRIs –in PG

- Fluvoxamine

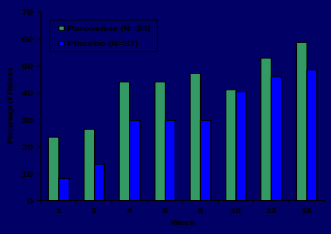
  195mg more effective than placebo (n=10 completers)

  200mg not statistically better than placebo (n=13 completers)

- Paroxetine

  52mg more effective than placebo (n=41 completers) (Kim et al. 2002)

## Patients (%) Improved Markedly With PG- CGI I Score ≤ 2 w/ paroxetine or PBO




59% response rate in the paroxetine group
49% rate in the placebo group
45 completers (Grant et al. 2003)

## SSRI Trials in Compulsive Buying

| Treatment | Duration | Sample | Mean daily dose (± SD) | Outcome |
|---|---|---|---|---|
| Fluvoxamine (Luvox) | 9 weeks | 23 enrolled 18 completed | 220 mg | Comparable improvement |
| Fluvoxamine (Luvox) | 13 weeks | 37 enrolled 23 completers | 215 mg (± 76.5) | Comparable improvement |
| Citalopram (Celexa) | 7 week open-label followed by 9 weeks randomized | 24 enrolled 15 randomized | 42.1 mg (± 15.3) | Citalopram group significantly improved compared to placebo |

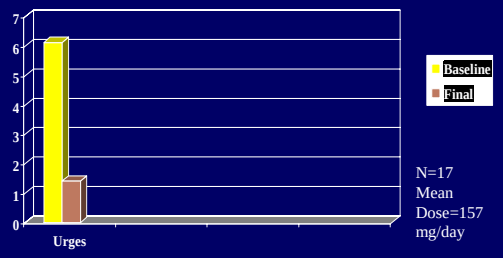
## Other Pharmacological Treatments for PG

- Lithium carbonate SR
  - Double-blind study – 29 completers; mean dose 1170mg/day; significant improvement
- Olanzapine
  - Double-blind study – 21 completers; mean dose 10mg/day; no difference between medication and placebo

## Role for Opioid Antagonists

- The mu-opioid system:
  - underlies urge regulation through the processing of reward, pleasure and pain, at least in part via modulation of dopamine neurons in mesolimbic pathway through GABA interneurons.
  - site at which beta-endorphins, morphine and heroin act as agonists.
  - linked to physiological responses during Pachinko.
  - Low levels of beta-endorphin seen in horse race gamblers.

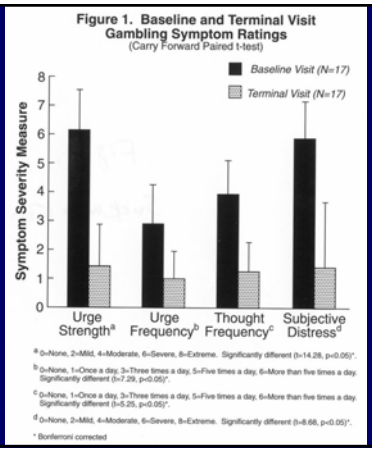
## OPEN NALTREXONE TREATMENT STUDY in PG



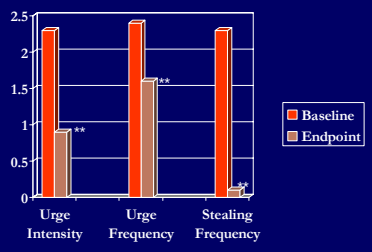

N=17
Mean Dose=157 mg/day

## Double-Blind Study of Naltrexone in PG

| Design | Sample size | Mean daily dose | Outcome |
|---|---|---|---|
| 12-week, 1-week placebo lead-in | 89 enrolled, 45 completers | 188 mg | Significant improvement on CGI and G-SAS |




## An Open-Label Study of Naltrexone in the Treatment of Kleptomania




70% very much improved; 20% much improved
(Grant and Kim, 2002)

## Cognitive Behavioral Therapy -PG

- CBT superior to wait list control at 12 months - 2 studies
- CBT workbook alone or with single in-depth interview. Both showed significant improvement at 6 months
- CBT workbook vs. workbook + telephone motivational enhancement intervention vs. waiting list. At 2-years, significant advantage of the workbook + telephone intervention.

## 12-Step Programs

- Gamblers Anonymous
- Sexaholics Anonymous
- Shoplifters Anonymous
- Shoppers Anonymous

## Diagnosis of Comorbidity

- Obsessive compulsive disorder
- Bipolar disorder or bipolar II disorder
- Borderline personality disorder
- Antisocial personality disorder/conduct disorder
- ADHD
- Major depressive disorder

## Conclusions

- Impulse Control Disorders are common disorders
- Frequently co-occur with substance use disorders
- Result in significant distress as well as social and functional impairment.
- Emerging data suggest they may respond well to pharmacological and psychotherapeutic interventions.